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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,874	10/21/2005	Shigeyuki Ikeda	529.45479X00	1231

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EXAMINER

YUN, JURIE

ART UNIT	PAPER NUMBER
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2882

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/553,874

Applicant(s)

IKEDA ET AL.

Examiner

Jurie Yun

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 10/21/05.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. The preliminary amendment filed 10/21/05 has been entered.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Amitani (JP 2000-175892)-(machine English language translation provided).
5. With respect to claims 1 and 3, Amitani discloses an X-ray image diagnostic apparatus, characterized by comprising: an X-ray source (1) that irradiates X-rays to a subject; an X-ray flat panel detector (2) that is provided oppositely to the X-ray source and detects transmitted X-rays from the subject as an X-ray image; image processing means (3) for applying image processing to the X-ray image detected by the X-ray flat panel detector; and image display means (5) for displaying the X-ray image having undergone the image processing in the image processing means, wherein the image processing means includes: storage means for storing plural sets of residual image data, acquired in advance from X-ray images in X-ray image acquisition modes from the X-ray flat panel detector before an actual measurement, in correspondence with the X-

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ray image acquisition modes; and residual image correction means for correcting residual image data contained in an X-ray image in the actual measurement from the X-ray flat panel detector, using the residual image data stored in the storage means; wherein the storage means stores plural frames of images of a residual image while X-rays are shielded after an X-ray image is acquired at a specific X-ray dose in advance (paragraphs 0009, 0016, 0021, 0029-0034, and 0053).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amitani (JP 2000-175892)-(machine English language translation provided) as applied to claim 1 above, and further in view of Ishikawa (JP 2003-010159)-(machine English language translation provided).

8. With respect to claim 2, Amitani discloses the image processing portion includes: an image memory (paragraphs 0021 and 0053) that stores one frame of the residual image data from the X-ray flat panel detector (2), and an attenuation quantity storage portion that stores quantities of attenuation of first and subsequent frames of the residual image data read out from the image memory; and a control portion that controls the image memory on the basis of respective signals, including control signals for each of the X-ray image acquisition modes including a radiographic signal and a fluoroscopic

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signal, and an image synchronizing signal to enable a display on the display means (5) (paragraphs 0009, 0016, 0021, 0029-0034, and 0053).

Amitani discloses all of the elements except for a computing unit that reads out the quantities of attenuation of the first and subsequent frames of the residual image data in response to a time on the basis of one frame of the residual image data stored in the image memory, and subtracts the read quantities of attenuation of the residual image data from a signal outputted from the X-ray flat panel detector; and a control portion that controls the image memory, the attenuation quantity storage portion, and the computing unit on the basis of respective signals. Ishikawa discloses this (paragraphs 0009-0027). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Amitani to have a computing unit that reads out the quantities of attenuation of the first and subsequent frames of the residual image data in response to a time on the basis of one frame of the residual image data stored in the image memory, and subtracts the read quantities of attenuation of the residual image data from a signal outputted from the X-ray flat panel detector; and a control portion that controls the image memory, the attenuation quantity storage portion, and the computing unit on the basis of respective signals, to obtain better images.

Allowable Subject Matter

9. Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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10. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose an X-ray image diagnostic apparatus, characterized by comprising plural image memories, plural attenuation quantity storage portions, a weight addition quantity storage portion that reads out quantities of attenuation of the first and subsequent frames of the residual image data in response to a time on the basis of one frame of the residual image data stored in each of the image memories, subjects the read quantities of attenuation of residual images to weighting addition depending on magnitude of a quantity of remaining residual images, and stores weight addition quantities; a computing unit that reads out the weight addition quantities stored in the weight addition quantity storage portion in response to a time, and subtracts the read weight addition quantities from a signal outputted from the X-ray flat panel detector; and a control portion that controls the image memories, the attenuation quantity storage portions, and the weight addition quantity storage portion on the basis of respective signals, including control signals for each of the X-ray image acquisition modes including a radiographic signal and a fluoroscopic signal, and an image synchronizing signal to enable a display on the display means, as claimed in claim 4.

Prior art fails to disclose an X-ray image diagnostic apparatus, characterized by comprising plural attenuation quantity storage portions, each of which stores quantities of attenuation of first and subsequent frames of the residual image data on the basis of one frame from the image memory switched by the first switch, in correspondence with the read pixel matrix of the X-ray flat panel detector; a second switch that reads out a quantity of attenuation of a residual image stored in the attenuation quantity storage

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portions in response to a time, and makes a switch to the read quantity of attenuation of the residual image data; a computing unit that subtracts the quantity of attenuation of the residual image data switched by the second switch from a signal outputted from the X-ray flat panel detector; and a control portion that controls the image memory, the attenuation quantity storage portions, and the first and second switches on the basis of respective signals, including control signals for each of the X-ray image acquisition modes including a radiographic signal and a fluoroscopic signal, and an image synchronizing signal to enable a display on the display means, as claimed in claim 5.

Prior art fails to disclose an X-ray image diagnostic apparatus, characterized by comprising plural attenuation quantity storage portions, each of which stores quantities of attenuation of first and subsequent frames of the residual image data on the basis of one frame from the image memory switched by the first switch, in correspondence with the single radiographic mode and the continuous radiographic mode; a second switch that reads out a quantity of attenuation of the residual image stored in the attenuation quantity storage portions in response to a time depending on the single radiographic mode or the continuous radiographic mode, and makes a switch to the read quantity of attenuation of the residual image; a computing unit that subtracts the quantity of attenuation of the residual image switched by the second switch from a signal outputted from the X-ray flat panel detector; and a control portion that controls the image memory, the attenuation quantity storage portions, and the first and second switches on the basis of respective signals, including control signals for each of the X-ray image acquisition modes including a radiographic signal and a fluoroscopic signal, and an image

synchronizing signal to enable a display on the display means, as claimed in claim 6.

Claim 7 is allowable due to its dependency on claim 6.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee (USPN 5,969,360) discloses a method for eliminating residual image artifacts from prior image exposures by a process which includes obtaining and averaging pre and post exposure image data from the detector and subtracting the averaged pre and post exposure data from the image exposure data. Petrick et al. (USPN 5,920,070) disclose eliminating ghost images resulting from release of charge trapped in photodiodes during prior exposures by adjusting the biasing during a reset portion of the imaging cycle. Ikeda (USPN 7,042,979 B2) discloses an offset data calculator for calculating the offset data based on data obtained from an X-ray flat panel detector while no X-ray is incident in each of the modes. Gransfors et al. (US 2003/0223539 A1) disclose a method and apparatus for acquiring and storing multiple offset corrections for flat panel detectors.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 571 272-2497.

The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Julie Yun
Examiner
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March 6, 2007